



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,004	01/20/2004	Tai-Chun Huang	TS03-484	1655
42717	7590	09/12/2005	EXAMINER	
HAYNES AND BOONE, LLP 901 MAIN STREET, SUITE 3100 DALLAS, TX 75202			DANG, TRUNG Q	
			ART UNIT	PAPER NUMBER
			2823	
DATE MAILED: 09/12/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/761,004	HUANG ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Trung Dang	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. ____   |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____  | 6) <input type="checkbox"/> Other: ____                                     |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cole (US 6,705,925 of record).

The reference teaches a method to singulate a circuit die from an integrated circuit wafer comprising:

providing an integrated circuit wafer containing a circuit die having non-rectangular, irregular shape (Fig. 5 and col. 3, lines 1-3);

cutting through said integrated circuit wafer by using water jet cutting system, the die cutting operation is performed using coordinates that are calculated and programmed into the cutting system computer (Figs. 4, 8 and col. 6, lines 8-30; col. 7, lines 31-58).

Although Cole discloses that the cutting operation uses a set of pre-calculated data fed from the computer (Fig. 4), Cole is silent about the cutting is performed by a single, continuous cut as claimed.

However, it would have been obvious to one of ordinary skill in the art to perform the curvilinear cutting disclosed in Cole in a single, continuous cut because

Art Unit: 2823

would be impractical to cut a curvilinear shape by feeding the computer a new set of coordinates data for every indefinite straight lines cut that approximate the curve.

2. Claims 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cole in view of Fu of record.

Cole teaches a singulation method as described above. Cole differs from the claims in not specifically disclosing that the non-rectangular, irregular shaped dice having the shapes as claims.

Fu teaches a wafer contains a plurality of dice in different shapes and sizes (Fig. 5). The arrangement of dice with various shapes in the same wafer increases wafer utilizable area (col. 4, lines 17-34).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Cole's teaching by fabricating the non-rectangular, irregular shaped dice having the shapes as suggested by Fu because dice having such shapes would have the benefit of increasing wafer utilizable area.

3. Claims 10, 11, 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cole in view of the admitted prior art.

Cole teaches a singulation method as described above. Cole differs from the claims in not disclosing the mounting of the singulated die to a package and coupling signal pins of said package to signals in said electronic circuit as claimed.

The admitted prior art of Fig. 4 teaches singulated die 38 is fixably mounted to a package 42 and then coupling signal pins 46 of said package to signals in the die through wire 54.

It would have been obvious to one of ordinary skill in the art to modify Cole's teaching by mounting and wire connecting the singulated die in the manner suggested by the admitted prior art because such practice is widely known in the manufacture of semiconductor chip.

As for the device claim 20, the combined process of Cole and the admitted prior art would result in the structure as claimed.

4. Claims 12-16 and 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cole as applied to claims 10-11, 18 and 20 above, and further in view of Fu cited above.

The combined process of Cole and the admitted prior art teaches a method a noted above. The combination differs from the claims in not disclosing that the non-rectangular, irregular shaped dice having the shapes as claims.

Fu teaches a wafer contains a plurality of dice in different shapes and sizes (Fig. 5). The arrangement of dice with various shapes in the same wafer increases wafer utilizable area (col. 4, lines 17-34).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teaching of the combined process by fabricating the non-rectangular, irregular shaped dice having the shapes as suggested by Fu because dice having such shapes would have the benefit of increasing wafer utilizable area.

As for device claims 21-25, the combination of three references described above would result in the structure as claimed.

5. Claims 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cole in view of Takiar of record.

Cole teaches a singulation method as described above. Cole differs from the claims in not disclosing that the non-rectangular, irregular shaped die is cut using a laser.

Takiar teaches cutting non-rectangular shaped die from a wafer using either water jet or laser (para. [0043]).

It would have been obvious to one of ordinary skill in the art to modify Cole's teaching by employing a laser to singulate the non-rectangular die as suggested by Takiar because the substitution of art recognized alternatives to make the same would have been within the level of one skilled in the art, absent a showing of criticality or unexpected result by applicants.

6. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cole as applied to claims 10, 11, 18 and 20 above, and further in view of Takiar.

The combined process of Cole and the admitted prior art teaches a method as noted above. The combination differs from the claims in not disclosing that the non-rectangular, irregular shaped die is cut using a laser.

Takiar teaches cutting non-rectangular shaped die from a wafer using either water jet or laser (para. [0043]).

It would have been obvious to one of ordinary skill in the art to modify the combined process of Cole and the admitted prior art by employing a laser to singulate the non-rectangular die as suggested by Takiar because the substitution of art recognized alternatives to make the same would have been within the level of one skilled in the art, absent a showing of criticality or unexpected result by applicants.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Trung Dang whose telephone number is 571-272-1857. The examiner can normally be reached on Mon-Friday 9:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

Art Unit: 2823

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Trung Dang  
Primary Examiner  
Art Unit 2823

09/06/05